federal register

THURSDAY, MAY 10, 1973

WASHINGTON, D.C.

Volume 38 ■ Number 90

PART II

DEPARTMENT OF TRANSPORTATION

Coast Guard

■

GREAT LAKES LOAD LINES

Establishment of Load Lines; Calculation and Assignment of Freeboards, etc.

Title 46—Shipping

CHAPTER I—COAST GUARD, DEPARTMENT OF TRANSPORTATION

[CGD 73-49R]

GREAT LAKES LOAD LINES

Establishment of Load Lines; Calculation and Assignment of Freeboards, etc.

The purpose of these amendments to the regulations governing Great Lakes loadlines is to adopt new provisions for the calculations of freeboards and additional conditions of assignment of freeboards and loadlines.

In the March 23, 1973, issue of the FEDERAL REGISTER (38 FR 7678), the Coast Guard proposed regulations to adopt new provisions for the calculations of freeboards including new conditions of assignment.

Written and oral comments were received from respondents in both United States and Canada and included the shipowners, shipbuilders, classification societies, and governmental representatives from the Board of Steamship Inspection and the Coast Guard.

All commenters were in favor of the new regulations but many changes were suggested for clarification or to improve administration. There were also several substantive suggestions for changes in requirements.

The following is a discussion on comments received for substantive changes to the proposal and an explanation of the changes that were made by the Coast Guard.

In part 42 a number of changes were made to implement the new part 45. In § 42.03–5, references for Great Lakes voyages were placed into a separate paragraph and require that vessels 79 feet or more on such voyages would be subject to the new regulations in part 45. In § 42.03–3 a new exception procedure was introduced and explained. In § 42.05–3, "existing vessel" has been further defined to explain that the new regulations do not specifically refer to an "existing" vessel but that all vessels prior to the new regulations will be considered existing vessels unless they can comply with subpart D in the new part 45 to be considered new vessels. In § 42.05–40(c), Victoria Bridge, Montreal, Canada, is the dividing line between fresh water and salt water in the St. Lawrence River which has been used by the Canadian authorities for many years. The duration of the loadline certificate and the amount of time that it may be extended has been inserted in § 42.07–5. The surveys by the American Bureau of Shipping or other approved assigning authority have been clarified for Great Lakes vessels in § 42.09–15(c) and the requirements on stability and strength have been noted in § 44.05–25(a).

In part 44, it was especially necessary to modify the present wording such that the new calculations for freeboard would not be used on the ocean routes. Special service, although it is used within 20 miles of land along our coasts, may be subject to ocean-sea conditions and the residual seaways from ocean storms which affects the shipping along our coasts. The new freeboard table and the calculations for the Great Lakes are based on studies which have shown that the wave conditions on the Great Lakes may approach ocean conditions of moderate but not full height. Therefore while special service loadlines are continued, the older regulations of part 45 for calculation of freeboards will be used where Great Lakes regulations are indicated in part 44.

In the new part 45, the following changes have been made:

Section 45.3 Paragraph (h), Freeboard Deck—definition of.—The definition of freeboard deck in part 45 is similar to the definition in the International Load Line Convention, 1966, on which these new regulations are modeled. A suggestion was made that the assigning authority should also designate the lower deck as the freeboard deck. This suggestion was not adopted because the Coast Guard wants a record of those vessels which utilize this special definition. This can best be done by submitting a request to the Commandant when such a designation is desired.

A general request was made that the several places where the Commandant is mentioned be modified by adding the words "assigning authority". All of these sections were reviewed and in several cases it appeared proper to add a reference to the assigning authority. The other sections where this has not been adopted are felt to be information which the Commandant should be particularly advised on or they were sections in which both the Commandant and the classification society were already mentioned.

Paragraph (l), Length of Superstructure—definition of.—It was suggested that this definition should include the phrase "which extend to the sides of the vessel". This change has been adopted since it clarifies the definition.

Paragraph (p), Exposed position—definition of.—It was suggested that the alternate definition of "exposed positions" which is based on the Convention wording for superstructures was superfluous. The comment was accepted and paragraph (p)(2) was deleted.

Paragraph (r), Steel—definition of.—Many comments were made on this definition. It was pointed out that the several parameters in the proposals were not the only ones which would occasionally be used nor would all of them be used at the same time on every occasion. A change to the definition was made based on these comments to reflect that the parameters are some of the items with which equivalency is judged.

Section 45.5. A typographical error in the winter loadlines in paragraph (d) was corrected from March 15 to 31.

Section 45.11.

Section 45.11. This section was changed to three paragraphs instead of two for readers convenience and understanding.

Section 45.15. A number of comments were received that suggested that the last sentence in paragraph (b) should show to whom the Commandant will communicate details of a special exemption. The intent was that this would be an exchange of information between the United States and Canada in continuation of the spirit of the cooperation which has existed since the regulations were inaugurated. The suggestion was approved and the change has been made.

Section 45.31. Section 45.31 and figure 1 pertains to the deck line. The Administrations has proposed a change from the 15 inches which is currently used on the Great Lakes to 12 inches in order to be consistent with international practice. In accordance with the suggestions received that 15 inches be continued, the requirement has been modified by adding the words "at least" to precede the words "12 inches long".

It was suggested that the Joint Technical Committee's recommendation to use the inner intersection line on the hull plating be used. The administrations considered this suggestion but came to the conclusion that it would be better to retain the existing practice which is to use the outer intersection line since this practice is also in effect in the International Convention and a minor difference would be introduced into the regulations for no real purpose.

Sections 45.35 and 45.37. A suggestion was made that the vessel need not have all of its loadlines marked in the interests of simplifying the complicated seasonal marking as in figure 2. This suggestion was discussed between the two administrations of Canada and the United States. Canadian practice has been to place seasonal marks for all seasons at the applicable freeboard even when they coincide. The Coast Guard feels that this approach has the advantage of letting the observer know in a precise manner whether the vessel is on its proper marks for the season of the year without having to stop the ship, go to the bridge, and look at the certificate. A comment was made that many of the vessels which have reason to have a single seasonal loadline for all seasons by reason of structural limitations or draft limitations should not be required to have all seasonal letters painted on the ship and that only the line itself should be required. However the administrations feel that just the line itself would not suffice. In order to show what seasons are applicable and what are not applicable, all seasons must be marked.

Section 45.51. A suggestion pointed out that the use of the phrase "main deck", while usually denoting the weather deck on the oceans, has a traditionally different application on the Great Lakes. The suggestion has been approved and the requirement has been changed by inserting the words "freeboard" in place of the word "main".

Section 45.53. A number of suggestions were made concerning this section. One suggestion was to add the unit of length in the formulas to clarify the formulas, both for seasonal freeboards and when a scantling or subdivision draft is in effect. The suggestion has been approved.

It was suggested that the word "geometric" be introduced in the text concerning summer freeboard. Although the word is understandable technically, the suggestion was not approved in order to avoid extra definitions in the regulations.

Section 45.55. A suggestion was made to reverse the order of the formulas so that they would be more coherent. Also the L/D limitations in the Joint Technical Committee recommendation were inadvertently omitted in the proposal. Accordingly, the suggestions were approved and the proposed paragraph (a) is now paragraph (b), the proposed paragraphs (b) and (c) are now paragraph (a), and paragraph (c) contains the Joint Technical Committee's recommendation for L/D limitation.

Section 45.57. One comment pointed out that the use of the word "Commandant" might be modified by allowing the approved assigning authority to handle a modification of deck line position. This comment was accepted. Also, another comment pointed out that we had not picked up the recommendation of the Joint Technical Committee that no freeboard of less than 2 inches may be assigned. This omission was corrected.

Table 4. Several typographical errors were corrected.

Section 45.65. It was suggested that paragraph (d) be rewritten to conform with the International Load Line Convention, 1966. The suggestion was approved and wording very similar to the Convention was inserted. Also, a comment requested the deletion of the explanatory sentence on the parabolic formula without deleting the formula itself. This suggestion was also approved.

Section 45.69. The bow height calculation has been modified to apply only to manned vessels in order to agree with the concept of its use in the International Load Line Convention, 1966.

Sections 45.71, 45.73, and 45.75. There were a number of typographical errors pointed out and a suggestion for adding the units of length. In §§ 45.73 and 45.75, the word "more" has been changed to "less" in accordance with the original Joint Technical Committee recommendation.

Section 45.77. It was pointed out that the addition for a vessel which does not have calculated immersion information from the Joint Technical Committee Report was omitted. Accordingly, the omission was corrected.

Sections 45.103 and 45.105. It was suggested that the word "unacceptable" be used in place of the word "excessive" since an acceptable standard is defined in the interim strength standard for the Great Lakes. This suggestion was approved.

Section 45.115. Two suggestions concerning paragraph (a) were adopted—

(1) Deckhouses on the freeboard deck should be required to have guardrails; and

(2) Paragraph (c) should be reworded to refer to paragraph (a) so that not only the open rails would be described but also the bulwarks which should be in place along the unmentioned half of the trunk length would be covered. These suggestions were approved.

Section 45.127. Comments pointed out that paragraph (a)(3) was not understandable. Upon review, it was determined that an error in editing had occurred. This paragraph has been corrected and shortened.

In paragraph (b)(2), the words "or more" were inserted after "Hs" for clarification.

Section 45.133. Several comments were received regarding the requirement of proper installation. The comments stated that improper installation would be obvious, something which an inspector would require to be corrected immediately. Also a request was received to avoid defining the thickness in terms of "corrosion or fatigue." Accordingly, both suggestions were accepted and the same general term that was used for superstructures has been used in this section. Additionally, it was pointed out that the height of the air pipes was not as accurate as in the Joint Technical Committee proposal, and this has been changed.

Section 45.139. A paragraph has been added further defining the requirements on side scuttles to require deadlights in accordance with the recommendation made by the Joint Technical Committee.

Section 45.145. This change corrects a printing error that occurred in the proposed rulemaking. The positions of the formulas have been corrected.

Section 45.147. Paragraph (c) was added in accordance with the Joint Technical Committee's recommendations that when the safety of the ship is not impaired, the height of coamings might be reduced.

Section 45.153. There were comments on the use of the term "fatigue resistance" in paragraph (a). However, the term has been retained and the words "to the hull" have been inserted for clarification. The words "approved by the Commandant" have been deleted to eliminate inference that the Commandant will approve every through-hull fitting. Instead the regulations now serve as an engineering guidance for the designer and builder and requires that hull pipes through hull fittings must be equivalent in strength to the hull.

Section 45.157. It was necessary to clarify the first sentence so that the reader may determine whether 24 inches or 0.5B would be used. The second sentence has been re-edited to call for thickness not less than extra heavy pipe.

Joint review. In addition to the development of the original proposal by the Joint Technical Committee established by the United States and Canada, the comments and recommendations made on the proposed rulemaking have been subject to review by both the Board of Steamship Inspection of Canada and the Coast Guard. Both Agencies have commented to each other and have compared their regulations for similar intent. This is a continuing effort. While the Canadian and United States regulations differ in official format, both sets of regulations conform to substantive requirements. It is the intent of the Coast Guard and the Board of Steamship Inspection of Canada to maintain each country's Great Lakes load line regulations to be as similar as possible in accordance with the agreement set up by the exchange of notes in 1938 through 1940 by the Secretary of State of the United States and his counterpart, the Minister of the Exterior for Canada.

In consideration of the foregoing, the proposed regulations published in the March 23, 1973, issue of the FEDERAL REGISTER (38 FR 7678), are hereby adopted, with the above described changes, and chapter I of title 46, Code of Federal Regulations, is amended as follows:

PART 42—DOMESTIC AND FOREIGN VOYAGES BY SEA

§ 42.03–1 [Amended]

1. By amending § 42.03–1(b) by striking the words *"Provided, further,* That no loadline requirements in this part implementing only the 1966 Convention shall apply to vessels solely navigating the Great Lakes of North America (see § 42.05–40)" and inserting the following words: *"Provided, further,* That loadline requirements in this part derived solely from the 1966 Convention do not apply to vessels navigating the Great Lakes of North America (see § 42.05–40); *Provided, further,* That loadline requirements for vessels that operate solely on waters of the Great Lakes, including the St. Lawrence River, are contained in part 45 of this subchapter."

2. By amending § 42.03–5 by revising paragraph (c) and adding paragraph (d) to read as follows:

§ 42.03–5 U.S. flag vessels subject to the requirements of this subchapter.

* * * * *

(c) *Vessels engaged solely on Great Lakes voyages.*—A U.S. flag vessel 79 feet and more and 150 gross tons or over that engages solely on Great Lakes voyages is subject to the applicable provisions of this part and part 45 of this subchapter and must comply with the regulations in force on the date the keel is laid or a similar progress in construction is made.

(d) *Special service coastwise voyage.* A U.S. flag vessel 150 gross tons or over that engages in a "special service coastwise voyage" is subject to the applicable provisions of this part and part 44 of this subchapter.

3. By amending § 42.03–30 by adding a sentence to follow the second sentence in paragraph (b)(2) and revising paragraphs (e) and (f) to read as follows:

§ 42.03–30 Exemptions for vessels.

* * * * *

(b) * * *

(2) * * * If the Commandant grants an exemption pursuant to this subparagraph to a U.S. flag vessel that operates on the Great Lakes of North America, he may notify the Chairman of the Board of Steamship Inspection of Canada of the nature of the exemption, but no special exemption certificate is issued.

* * * * *

(e) The Commandant may exempt from any of the requirements of this part a vessel that engages on a domestic voyage by sea or a voyage solely on the Great Lakes and embodies features of a novel

kind, if the novel features and any additional safety measures required are described on the face of the issued certificate.

(f) A vessel that is not usually engaged on domestic voyages by sea or on voyages on the Great Lakes but that, in exceptional circumstances, is required to undertake a single such voyage between two specific ports is—

(1) Subject to the Coastwise Load Line, Act, as amended and the applicable regulations of this subchapter; and

(2) Issued a single voyage load line authorization by the Commandant that states the conditions under which the voyage may be made and any additional safety measures required for a single voyage.

4. By revising paragraph (e) of § 42.05–30 to read as follows:

§ 42.05–30 Existing vessel.

* * * * *

(e) As used in part 45 of this subchapter, "existing vessel" in all regulations pertaining to a vessel engaged solely on Great Lakes voyages before April 14, 1973, means a vessel whose keel was laid before August 27, 1936. The regulations pertaining to these vessels that are in effect after April 14, 1973, do not use the term "existing vessel".

* * * * *

5. By amending § 42.05–40(c) by adding a sentence to follow the first sentence to read as follows:

§ 42.05–40 Great Lakes.

* * * * *

(c) * * * In addition, the Victoria Bridge, Montreal, Canada, is the dividing line between fresh water and salt water in the St. Lawrence River.

6. By striking in the second sentence of § 42.07–1(b) the reference "§ 45.01–75 (b)" and inserting "§ 45.9" in place thereof.

7. By striking in the first sentence of § 42.07–1(c) the reference "parts 44 and 45" and inserting "part 45" in place thereof.

8. By revising § 42.07–45(d) to read as follows:

§ 42.07–45 Loadline certificates.

* * * * *

(d) Each loadline certificate is issued for the following length of time:

(1) An international and coastwise certificate is issued for 5 years and may be extended by the Commandant up to 150 days from the date of the—

(i) Survey that is endorsed on the certificate by the surveyor authorized by the Coast Guard; or

(ii) Last day of the 5-year period.

* * * * *

(2) A Great Lakes certificate is issued for 5 years and may be extended by the Commandant up to 90 days from the date of the—

(i) Survey that is endorsed on the certificate by the surveyor authorized by the Coast Guard; or

(ii) Last day of the 5-year period.

* * * * *

9. By revising the second sentence of § 42.09–15(c)(1) reading as follows:

§ 42.09–15 Surveys by the American Bureau of Shipping or assigning authority.

* * * * *

(c) * * *

(1) * * * If, after a survey has been passed, a loadline certificate can not be issued before the current certificate expires, the current certificate may be extended by an endorsement in accordance with the requirements contained in § 42.07–45(d). * * *

* * * * *

PART 44—VARIANCE FOR STEAM COLLIERS, BARGES, AND SELF-PROPELLED BARGES (WHEN ENGAGED IN SPECIAL SERVICES ON COASTWISE AND INTERISLAND VOYAGES)

10. By amending § 44.05–25 by revising paragraph (a)(2) and adding subparagraph (3) to read as follows:

§ 44.05–25 Freeboards.

(a) * * *

(2) The requirements in §§ 42.09–1 and 42.09–10 that relate to the assignment of freeboards and to stability are applicable to each vessel subject to the requirements in this part.

(3) The assigning authority that assigns a vessel subject to the requirements in this part a freeboard under part 45 of this chapter shall do so in accordance with the requirements in effect as of October 1, 1972.

PART 45—GREAT LAKES LOAD LINES

11. By revising part 45 to read as follows:

Subpart A—General

Sec.
45.1 Purpose.
45.3 Definitions.
45.5 Seasonal application of load lines.
45.9 Seasonal application of load lines for vessels not marked under this part.
45.11 Issue of load line certificate.
45.13 Form of certificate.
45.15 Exemptions.

Subpart B—Load Line Marks

45.31 Deck line.
45.33 Diamond.
45.35 Seasonal load lines.
45.37 Salt water load lines.
45.39 Marking.

Subpart C—Freeboards

45.51 Types of ships.
45.53 Summer freeboard.
45.55 Freeboard coefficient.
45.57 Correction: Position of deck line.
45.58 Correction: Short superstructure.
45.59 Definitions for superstructure corrections.
45.61 Correction for superstructures and trunks.
45.63 Correction for sheer.
45.65 Excess sheer limitations.
45.67 Sheer measurement.
45.69 Correction for bow height.
45.71 Midsummer freeboard.
45.73 Winter freeboards.
45.75 Intermediate freeboard.
45.77 Salt water freeboard.

Subpart D—Conditions of Assignment

45.101 Purpose.
45.103 Structural stress and stability.
45.105 Information supplied to the master.
45.107 Strength of hull.
45.109 Strength of superstructures and deckhouses.
45.111 Strength of bulkheads at ends of superstructures.
45.113 Access openings in bulkheads at ends of enclosed superstructures.
45.115 Bulwarks and guard rails.
45.117 Freeing port area: General.
45.119 Freeing port area; Changes from standard sheer.
45.121 Freeing port area: Changes for trunks and side coamings.
45.123 Freeing port area: Changes for bulwark height.
45.125 Crew passageways.
45.127 Position of structures, openings, and fittings.
45.129 Hull fittings: General.
45.131 Ventilators.
45.133 Air pipes.
45.135 Hull openings at or below freeboard deck.
45.137 Cargo ports.
45.139 Side scuttles.
45.141 Manholes and flush scuttles.
45.143 Hull openings above freeboard deck.
45.145 Hatchway covers.
45.147 Hatchway coamings.
45.149 Machinery space openings.
45.151 Other openings.
45.153 Through-hull piping: General.
45.155 Inlets and discharge piping: Valves.
45.157 Scuppers and gravity drains.
45.159 Special conditions of assignment for type "A" vessels.
Appendix A Loadline certificate form.

AUTHORITY.—Sec. 2, 49 Stat. 888, as amended, sec. 6(b)(1), 80 Stat. 937; 46 U.S.C. 88a, 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b).

Subpart A—General

§ 45.1 Purpose.

This part prescribes requirements for assignment of freeboards, issuance of loadline certificates, and marking of loadlines to meet the requirements of the Coastwise Load Line Act, 1935 (46 U.S.C. 88–88g) insofar as it applies to the Great Lakes of North America.

§ 45.3 Definitions.

As used in this part:

(a) "Length (L)" means 96 percent of the total length on a waterline at 85 percent of the least moulded depth measured from the top of the keel or the length from the foreside of the stem to the axis of the rudder stock on that waterline, if that is greater. In ships designed with a rake of keel the waterline on which this length is measured must be parallel to the designed waterline.

(b) "Perpendiculars" means the forward and after perpendiculars at the forward and after ends of the length (L). The forward perpendicular coincides with the foreside of the stem on the waterline on which the length is measured.

(c) "Amidships" means the middle of the length (L).

(d) "Breadth" unless expressly provided otherwise, means the maximum breadth of the ship, measured amidships to the moulded line of the frame in a ship with a metal shell and to the outer surface of the hull in a ship with a shell of any other material.

(e) "Moulded Depth" means the vertical distance measured amidships from the top of the keel to the top of the freeboard deck beam at side except that—

(1) In vessels of other than metal construction, the distance is measured from the lower edge of the keel rabbet;

(2) Where the form at the lower part of the midship section is of a hollow character, or where thick garboards are fitted, the distance is measured from the point where the line of the flat of the bottom continued inwards cuts the side of the keel;

(3) In ships having rounded gunwales, this distance is measured to the point of intersection of the moulded lines of the deck and side, the lines extending as though the gunwale were of angular design; and

(4) Where the freeboard deck is stepped and the raised part of the deck extends over the point at which the moulded depth is to be determined, the distance is measured to a line of reference extending from the lower part of the deck along a line parallel with the raised part.

(f) "Depth for Freeboard (D)" means—

(1) Moulded depth amidships plus the thickness of the stringer plate with no allowance for sheathing; and

(2) In a vessel having a rounded gunwale with a radius greater than 4 percent of the breadth (B) or having topsides of unsual form, the depth for freeboard (D) of a vessel having a midship section with vertical topsides and with the same round of beam and area of topside section equal to that provided by the actual midship section.

(g) "Freeboard" means the distance measured vertically downwards amidships from the upper edge of the deck line to the upper edge of the related load line.

(h) "Freeboard Deck" means, normally, the uppermost complete deck exposed to weather and sea that has permanent means of closing all openings in the weather part thereof and below which all openings in the sides of the ship are fitted with permanent means of watertight closings except that—

(1) In a ship having a discontinuous freeboard deck, the lowest line of the exposed deck and the continuation of that line parallel to the upper part of the deck is the freeboard deck.

(2) At the option of the owner and subject to the approval of the Commandant a lower deck may be designated as the freeboard deck, if it is a complete and permanent deck continuous in a fore and aft direction at least between the machinery space and peak bulkheads and continuous athwartships;

(3) When this lower deck is stepped the lowest line of the deck and the continuation of that line parallel to the upper part of the deck is taken as the freeboard deck.

(i) "Superstructure" means a deck structure on the freeboard deck, extending from side to side of the ship or with the side plating not being inboard of the shell plating more than 4 percent of the breadth (B). A raised quarterdeck is a superstructure.

(j) "Enclosed superstructure" means a superstructure with enclosing bulkheads.

(k) "Height" of a superstructure means the least vertical height measured at side from the top of the superstructure deck beams to the top of the freeboard deck beams.

(l) "Length of a superstructure (S)" means the mean length of the part of the superstructure which extends to the sides of the vessel and lies within the length (L).

(m) "Flush deck ship" means a ship that has no superstructure on the freeboard deck.

(n) "Weathertight" means that in any sea conditions water will not penetrate into the ship.

(o) "Watertight" means designed to withstand a static head of water.

(p) "Exposed positions" means exposed to weather and sea.

(q) "Intact bulkhead" with respect to superstructure means a bulkhead with no openings.

(r) "Steel" means steel and materials with which structures can be made equivalent to steel with respect to such parameters as yield strength, total deflection, flexural life, or resistance to galvanic or stress corrosion.

§ 45.5 Seasonal application of loadlines.

For the purposes of the law and regulations prohibiting submergence of loadlines (46 U.S.C. 88c; 46 CFR 42.07–10), the fresh water and salt water loadlines marked under this part apply during the following seasons:

(a) Summer loadlines apply April 16 through April 30 and September 16 through September 30.

(b) Midsummer loadlines apply May 1 through September 15.

(c) Intermediate loadlines apply October 1 through October 31 and April 1 through April 15.

(d) Winter loadlines apply November 1 through March 31.

§ 45.9 Seasonal application of loadlines for vessels not marked under this part.

(a) For the purposes of the law and regulations prohibiting submergence of loadlines (46 U.S.C. 88c; 46 CFR 42.07–10) the marks assigned to vessels holding international loadline certificates apply during the following seasons:

(1) Vessels assigned freeboards as new vessels under the International Load Line Convention, 1966—

(i) Winter—November 1 through March 31.

(ii) Summer—April 1 through April 30 and October 1 through October 31.

(iii) Tropical—May 1 through September 30;

(2) Vessels assigned freeboards as existing vessels under the International Load Line Convention, 1966—

(i) Winter—November 1 through March 31;

(ii) Summer—April 1 through April 30 and October 1 through October 31;

(iii) Tropical—September 16 through September 30;

(iv) Tropical Fresh—May 1 through September 15.

(b) No allowances for lesser freeboards apply under any circumstances.

§ 45.11 Issue of Load Line Certificate.

(a) A vessel 79 feet in length and more, and 150 gross tons or over, the keel of which is laid or which has reached a similar stage of construction after April 14, 1973, must meet the requirements of this part.

(b) Except as prescribed in paragraph (a) of this section, any vessel that meets the requirements in subparts C and D of this part and the survey requirements in §§ 42.09–15 through 42.09–50 of this subchapter is entitled to assignment of freeboards and issue of a loadline certificate under this part by the Commandant or his authorized representative.

(c) A vessel, the keel of which was laid or was at a similar stage of construction before April 14, 1973, that meets the requirements of this part that were in effect before April 14, 1973, and the survey requirements in §§ 42.09–15 through 42.09–50 of this subchapter is entitled to the assignment of freeboards calculated under the provisions of this part in effect before April 14, 1973, and to a loadline certificate issued under this part by the Commandant or his authorized representative.

§ 45.13 Form of Certificate.

The form of a loadline certificate issued under this part is specified in appendix A to this part.

§ 45.15 Exemptions.

(a) The Commandant may exempt a ship from any of the requirements in this part if the chairman of the board of Steamship Inspections, Department of Transport, Canada, and the Commandant agree that the sheltered nature or the condition of that voyage make it unreasonable or impracticable to apply requirements of this part.

(b) The Commandant may exempt a vessel that embodies features of a novel kind from any of the requirements of this part if those requirements might seriously impede research into the development of such features and their incorporation in ships. Any such vessel must comply with the safety requirements that, in the opinion of the Commandant, are adequate for the service for which the vessel is intended and will insure the overall safety of the vessel. If the Commandant grants an exemption pursuant to this paragraph he communicates the details of the exemption and the reasons therefore to the chairman of the board of Steamship Inspections.

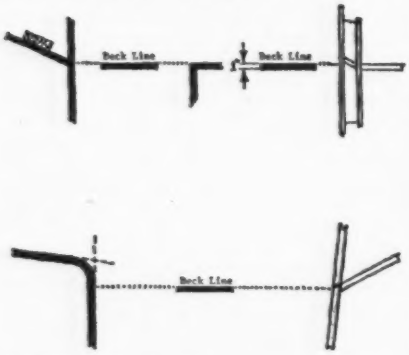
(c) A vessel that is not normally engaged on voyages to which this part applies but that, in exceptional circumstances, is required to undertake a single such voyage between two specific ports may be exempted by the Commandant from any of the requirements of this part, if the ship complies with safety requirements that, in the opinion of the Commandant are adequate for the voyage that is to be undertaken by the vessel.

Subpart B—Load Line Marks

§ 45.31 Deck line.

(a) Each vessel must be marked with a deck line on the outer surface of the shell on each side of the vessel with the upper edge of the line passing through the point where the upper surface of the freeboard deck intersects the outer surface of the shell or if the summer freeboard is correspondingly adjusted under § 45.57, the deck line may be placed above or below the freeboard deck. Figure 1 illustrates the deck line marking.

(b) Each deck line must be at least 12-inches long and 1-inch wide.



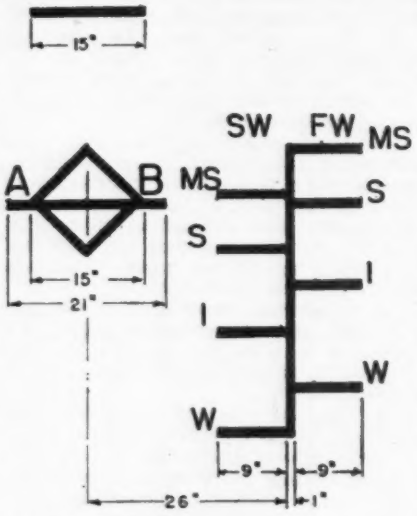
§ 45.33 Diamond.

(a) Each vessel must be marked with the diamond mark described in figure 2 of § 45.35 amidships below the upper edge of the deck line on each side with the center of the loadline mark at a distance below the deck line equal to the summer freeboard assigned under this part.

(b) The width of each line in the loadline mark must be 1 inch.

§ 45.35 Seasonal load lines.

Each vessel must have the summer (S), midsummer (MS), intermediate (I), and winter (W) loadlines for fresh water freeboards calculated under §§ 45.71 through 45.75 marked in accordance with § 45.39.



§ 45.37 Salt water loadlines.

Each vessel that operates in the salt water of the St. Lawrence River must—

(a) Be marked with the summer (S), midsummer (MS), intermediate (I) and winter (W) loadline marks under § 45.77 for salt water; and

(b) Be marked with the letters "FW" above the fresh water marks and the letters "SW" above the salt water marks as described in figure 2.

§ 45.39 Marking.

(a) The diamond, lines, and letters must be painted in white or yellow on a dark ground or in black on a light ground and permanently marked on the sides of the vessel.

(b) The upper edge of the line that passes through the center of the diamond must indicate summer freeboard assigned under § 45.53.

(c) Unless otherwise authorized the seasonal loadlines must be horizontal lines extending forward of, and at right angles to, a vertical line marked at a distance 26 inches forward of the vertical centerline of the diamond as described in figure 2.

(d) The salt water loadlines must be horizontal lines extending abaft the vertical line required by paragraph (b) of this section as described in figure 2.

(e) The upper edge of each seasonal and salt water loadline mark must indicate the minimum freeboard for that mark.

(f) When two freeboards assigned under this part differ by 2 inches or less, the line for the lesser freeboard must be omitted and the line for the greater freeboard must be identified with the seasonal letters for both freeboards.

(g) Seasonal freeboards that are limited by a summer freeboard assigned under § 45.53(c) must not be marked but the identifying letter must be marked adjacent to the summer mark.

(h) The identity of the authority that assigns the freeboard must be indicated alongside the loadline diamond above the horizontal line that passes through the center of the diamond with two initials approximately 4½ inches high and 3 inches wide.

Subpart C—Freeboards

§ 45.51 Types of ships.

(a) For the purpose of this subpart, a type A vessel has—

(1) No cargo ports or similar side-shell openings below the freeboard deck;

(2) Only small freeboard deck openings fitted with watertight gasketed hatch covers of steel;

(3) No dimension of a freeboard deck cargo opening greater than 6 feet and the total area not exceeding 18 ft²; and

(4) No more than two freeboard deck cargo openings to a single cargo space.

(b) For the purposes of this subpart a type B vessel is a vessel that does not meet the requirements in paragraph (a) of this section.

§ 45.53 Summer Freeboard.

(a) Except as required in paragraph (c) of this section, the minimum freeboard in summer for a type A vessel is F in the following formula modified by the corrections in this subpart:

$$F \text{ (inches)} = 10.2 \times P_1 \times D$$

where P_1 is defined in § 45.55 and D is the depth for freeboard in feet.

(b) Except as required in paragraph (c) of this section, the minimum freeboard in summer for a type B vessel is F in the formula modified by the corrections in this subpart:

$$F \text{ (inches)} = 12 \times P_1 \times D$$

where P_1 is defined by § 45.55 and D is the depth for freeboard in feet.

(c) Seasonal freeboards assigned under §§ 45.71 through 45.75 must be calculated on the basis of the summer freeboard calculated under paragraph (a) or (b) of this section.

(d) If a minimum freeboard is required for a vessel under this part which is greater than that required by paragraph (a) or (b) of this section because of scantling or subdivision requirements, the summer freeboard and the seasonal freeboards assigned under this subpart must be no less than that minimum freeboard, except the midsummer seasonal freeboard may be calculated on the basis of the summer freeboard assigned under this paragraph.

(e) If a greater than the calculated minimum freeboard is requested by the applicant for the loadline certificate, that greater freeboard may be assigned as the summer freeboard and—

(1) The intermediate and winter seasonal freeboards assigned must be calculated under paragraph (a) or (b) of this section; and

(2) The midsummer seasonal freeboard must be calculated on the basis of the summer freeboard assigned under this paragraph.

§ 45.55 Freeboard coefficient.

(a) For ships less than 350 feet in length (L), the freeboard coefficient is P_1 in the formula:

$$P_1 = P + A\left(\frac{L}{D} - \frac{L}{Ds}\right)$$

where P is a factor, which is a function of the length from table 1 and "A" is a coefficient, which is a function of length (L), from table 2; L/D is the ratio of the length (L) to the depth for freeboard (D); L/Ds is the ratio of the length (L) to a standard depth (Ds) from table 3.

D is not to be used as less than that which will give a ratio of L to D that is:

(a) More than 15 when L=400 feet or less, or

(b) More than 21 when L=700 feet or more, with the ratio for intermediate lengths being calculated proportionately.

(b) For ships 350 feet or more in length (L), the coefficient "A" is zero and the formula is:

$$P_1 = P$$

where P is a factor, which is a function of length from table (1).

§ 45.57 Correction: Position of deckline.

(a) Where the depth to the upper edge of the deckline is greater or less than D, the difference between the depths must be added to or deducted from the freeboard.

(b) When the Commandant or the approved assigning authority approves a location for the deckline that is above or below the freeboard deck, the minimum summer freeboard must be corrected by—

(1) Adding the difference between the depth and D if the depth is greater than D; and

(2) Subtracting the difference between the depth and D, if the depth is less than D.

(c) Except for the adjustment allowed in paragraph (b) of this section, no freeboard of less than 2 in. may be assigned.

§ 45.58 Correction: Short superstructure.

The minimum freeboard in summer for a type B vessel that is 79 ft. or more but less than 500 ft. in length and has enclosed superstructures with an effective length of 25 percent or less of the length of the vessel must be increased by—

0.03 (500—L) (0.25—E/L) inches

where (L) = length of vessel in feet;
(E) = effective length of superstructure in feet as defined in § 45.59.

§ 45.59 Definitions for superstructure corrections.

For the purpose of §§ 45.58 through 45.61—

(a) The standard height of a superstructure (H_s) other than a raised quarter deck and the standard height of a trunk (H_s) is determined by the formula:

$$H_s = \left(6.0 + \frac{L}{300}\right) \text{ ft}$$

(b) The length of superstructure (S) is the length of those parts of the superstructure which extends to the sides of the vessel and that lie within the length (L).

(c) The effective length (E) of a trunk is its length in the ratio of its mean breadth to B.

(d) The effective length (E) of an enclosed superstructure of standard height or greater is its length "S".

(e) Where the height of an enclosed superstructure or trunk is less than the standard height (H_s), the effective length (E) is its length reduced in the ratio of its height to H_s.

(f) The effective length (E) of a raised quarter deck of 2/3 H_s or greater that has no openings in the front bulkhead is its length up to a maximum of 0.6L.

(g) The effective length (E) of a raised quarter deck of less than 2/3 H_s or that does not have an intact front bulkhead is its length reduced by the ratio of its height to H_s.

TABLE 12(1)

TABLES OF P VALUES

Length of Ship (feet)	Value of P	Length of Ship (feet)	Value of P
80	0.1100	550	0.2751
90	0.1136	560	0.2762
100	0.1172	570	0.2772
110	0.1208	580	0.2779
120	0.1244	590	0.2785
130	0.1281	600	0.2788
140	0.1318	610	0.2790
150	0.1355	620	0.2790
160	0.1393	630	0.2789
170	0.1430	640	0.2785
180	0.1468	650	0.2779
190	0.1506	660	0.2772
200	0.1545	670	0.2768
210	0.1583	680	0.2760
220	0.1622	690	0.2751
230	0.1661	700	0.2740
240	0.1700	710	0.2728
250	0.1740	720	0.2715
260	0.1780	730	0.2700
270	0.1820	740	0.2684
280	0.1860	750	0.2667
290	0.1900	760	0.2648
300	0.1941	770	0.2628
310	0.1982	780	0.2607
320	0.2023	790	0.2584
330	0.2065	800	0.2560
340	0.2106	810	0.2532
350	0.2148	820	0.2504
360	0.2190	830	0.2476
370	0.2233	840	0.2448
380	0.2275	850	0.2420
390	0.2318	860	0.2392
400	0.2361	870	0.2364
410	0.2400	880	0.2336
420	0.2437	890	0.2308
430	0.2472	900	0.2280
440	0.2506	910	0.2252
450	0.2537	920	0.2224
460	0.2567	930	0.2196
470	0.2595	940	0.2168
480	0.2621	950	0.2140
490	0.2645	960	0.2112
500	0.2667	970	0.2084
510	0.2688	980	0.2056
520	0.2706	990	0.2028
530	0.2723	1000	0.2000
540	0.2738		

TABLE 12(2)

VALUES OF "A"
FOR USE IN THE EXPRESSION

$P_1 = P + "A"\ (L/D - L/Ds)$

Length of Ship (feet)	Value of "A"	Length of Ship (feet)	Value of "A"
80	0.00864	220	0.00234
90	0.00806	230	0.00204
100	0.00750	240	0.00176
110	0.00696	250	0.00150
120	0.00644	260	0.00126
130	0.00594	270	0.00104
140	0.00546	280	0.00084
150	0.00500	290	0.00066
160	0.00456	300	0.00050
170	0.00414	310	0.00036
180	0.00374	320	0.00024
190	0.00336	330	0.00014
200	0.00300	340	0.00006
210	0.00266	350	0.00000

TABLE 12(3)

VALUES OF L/DS

Length of Ship (feet)	Value of L/Ds	Length of Ship (feet)	Value of L/Ds
80	6.50000	250	11.01563
90	6.76563	260	11.28125
100	7.03125	270	11.54688
110	7.29688	280	11.81250
120	7.56250	290	12.07813
130	7.82813	300	12.34375
140	8.09375	310	12.60938
150	8.35938	320	12.87500
160	8.62500	330	13.14063
170	8.89063	340	13.40625
180	9.19625	350	13.67188
190	9.42188	360	13.93750
200	9.68750	370	14.20313
210	9.95313	380	14.46875
220	10.21875	390	14.73438
230	10.48438	400	15.00000
240	10.75000		

(h) Superstructures which are not enclosed have no effective length.

(i) When a lower deck is designated as the freeboard deck, that part of the hull which extends above the freeboard deck is treated as a superstructure so far as concerns the application of the conditions of assignment and the calculation of freeboard.

(j) A bridge or poop is enclosed only when access is provided whereby the crew may reach accommodations, machinery, or other working spaces inside the superstructure by alternative means that are available at all times when bulkhead openings are closed.

§ 45.61 Correction for superstructures and trunks.

(a) Where the effective length E of superstructures and trunks that meet the requirements of subpart D of this part is 1.0L, the minimum summer freeboard may be corrected by subtracting ½H_s.

(b) Where the effective length of superstructures and trunks is less than 1.0L the minimum summer freeboard may be corrected by subtracting a percentage of one-half of the standard superstructure height (H_s) determined by the formula:

$$\text{Percentage} = \frac{E}{2L} \times \left(1 + \frac{E}{L}\right) \times 100$$

(c) To be eligible for the correction a trunk must—

(1) Be at least as strong and as stiff as a superstructure;

(2) Have no opening in the freeboard deck in way of the trunk, except small access openings;

(3) Have hatchway coamings and covers that meet §§ 45.143 through 45.147;

(4) Provide a permanent working platform fore and aft with guardrails;

(5) Provide fore and aft access between detached trunks and superstructures by permanent gangways;

(6) Be at least 60 percent of the breadth of the ship in way of the trunk; and

(7) Be at least 0.6 *L* in length, if no superstructure is provided.

§ 45.63 Correction for sheer.

(a) The minimum summer freeboard must be increased by the deficiency, or may be decreased by the excess as limited by § 45.65, of sheer calculated from table 4, multiplied by:

$$0.75-\frac{S}{2L}$$

where *S* is the total length of enclosed superstructures. Trunks are not included.

§ 45.65 Excess sheer limitations.

The decrease in freeboard allowed in § 45.63 is limited as follows:

SHEER CALCULATION—TABLE 4

Station	Actual ordinate	S.M.	Product	
After Half:				
AP		1		
L/6–AP		3		
L/3–AP		3		
Midship		1	_____	
Sum of Aft Products			_____	
After Standard Sheer .2065L+26.65 [1]			_____	
Difference: Sum–STD			_____	+ Excess/−Deficiency
AFT Sheer: Diff÷8			_____	Excess/Deficiency

Station	Actual ordinate	S.M.	Product	
Fwd Half:				
FP		1		
L/6–FP		3		
L/3–FP		3		
Midships		1	_____	
Sum of Fwd Products			_____	
Fwd Standard Sheer .5330L+53.30 [1]			_____	
Difference: Sum–STD			_____	+ Excess/−Deficiency
FWD Sheer: Diff÷8			_____	Excess/Deficiency

[1] L in Standard Sheer=L or 500 whichever is less.

Sheer Summation

Aft Sheer +/−			_____	
Fwd Sheer +/−			_____	
Net Sheer +/−			_____	
Mean: Net−2			_____	Excess/Deficiency

(a) In vessels having no enclosed superstructure from 0.1 *L* abaft amidships to 0.1 *L* forward of amidships, no decrease is allowed.

(b) In vessels having enclosed superstructures amidships less than 0.1 *L* before and abaft amidships, the decrease must be reduced by linear interpolation.

(c) If excess sheer exists in the forward half, and the after half is at least 75 percent of standard sheer, the full decrease is allowed. If the after sheer is between 50 percent and 75 percent of standard sheer an intermediate decrease, determined by linear interpolation, is allowed for the excess sheer forward. If the after sheer is 50 percent of standard or less, no decrease is allowed for the excess sheer forward.

(d) Where an enclosed poop or forecastle is of standard height with greater sheer than that of the freeboard deck, or is greater than standard height, an addition to the sheer of the freeboard deck may be made using the following formula:

$$s=\frac{vL'}{3L}$$

Where *s*=sheer credit, to be deducted from the deficiency or added to the excess of sheer.

v=difference between actual and standard height of superstructure at the end ordinate.

L'=mean enclosed length of poop or forecastle up to a maximum length of 0.5 *L*.

The superstructure deck must not be less than standard height above this curve at any point. This curve must be used in determining the sheer profile for forward and after halves of the vessel.

(e) The maximum decrease for excess sheer must be no more than 1½ inches per 100 feet of length.

(f) Where the deck of an enclosed superstructure has at least the same sheer as the exposed freeboard deck, the sheer of the enclosed portion of the freeboard deck cannot be taken into account.

§ 45.67 Sheer measurement.

(a) The sheer is measured from the freeboard deck at side to a line of reference drawn parallel to the keel through the sheer line at amidships;

(b) In ships designed with a rake of keel or designed to trim by the stern, the sheer must be measured in reference to a line drawn through the sheer line at amidships parallel to the design load waterline.

(c) In flush deck ships and in ships with detached superstructures, the sheer must be measured at the freeboard deck.

(d) In ships with a step or break in the topsides, the sheer must be measured from the equivalent depth amidships.

(e) In vessels with a superstructure of standard height that extends over the whole length of the freeboard deck, the sheer must be measured on the superstructure deck. Where the height of superstructure exceeds the standard, the least difference (Z) between the actual and standard heights must be added to each end ordinate. Similarly, the intermediate ordinates at distance of 1/6 *L* and 1/3 *L* from each perpendicular must be increased by 0.444 Z and 0.111 Z respectively.

§ 45.69 Correction for bow height.

(a) The minimum summer freeboard of all manned vessels must be increased by the same amount in inches as any deficiency which may be shown by the following formulas:

(1) For vessels having a length of not less than 79 feet and not greater than 550 feet,

$0.593\ L\ (1.0-L/1640)$ inches—actual bow height

(2) For vessels having a length greater than 550 feet,

$(341.6-0.227\ L)$ inches—actual bow height

(b) Where the bow height is obtained by sheer, the sheer must extend for at least 15 percent of the length of the vessel measured from the forward perpendicular.

(c) Where the bow height is obtained by a superstructure, the superstructure must be enclosed and extend from the stem to a point at least 0.06 *L* abaft the forward perpendicular.

(d) Vessels which, to suit exceptional operational requirements, cannot meet the requirements of paragraph (c) of this section may be given special consideration by the Commandant.

(e) The bow height is defined as the vertical distance at the forward perpendicular between the waterline corresponding to the assigned summer freeboard at the designed trim and the top of the exposed deck at side.

§ 45.71 Midsummer freeboard.

The minimum midsummer freeboard (fms) in inches is obtained by the formula:

$$fms=f(s)-0.3Ts$$

where $f(s)$=summer freeboard in inches
Ts=distance in feet between top of keel and the summer load line.

§ 45.73 Winter freeboard.

The minimum winter freeboard (fw) in inches is obtained by the formula:

$$fw=f(s)+Ts\ (200)/L$$

where L=length L in feet but not less than 400 feet.

§ 45.75 Intermediate freeboard.

The minimum intermediate freeboard (f_I) in inches is obtained by the formula:

$$f_I=f(s)+Ts(100)/L$$

where L=length L in feet but not less than 400 feet.

§ 45.77 Salt water freeboard.

(a) The salt water addition in inches to freeboard applicable to each fresh water mark is obtained by the formula:

$$\text{Addition} = \Delta/41T$$

where Δ = displacement in fresh water, in tons of 2,240 pounds, at the summer load waterline.
T = tons per inch immersion, of 2,240 pounds, in fresh water at the summer load waterline.

(b) When the displacement at the summer load waterline cannot be certified, the addition in inches to the minimum freeboard in fresh water may be obtained by multiplying 0.25 by the summer draught in feet measured from the top of the keel to the center of the load line diamond.

Subpart D—Conditions of Assignment

§ 45.101 Purpose.

This subpart prescribes conditions that a vessel must meet to be eligible for assignment of a loadline under this part.

§ 45.103 Structural stress and stability.

(a) The nature and stowage of the cargo, ballast, and other variable weights must be such as to make the vessel stable and avoid unacceptable structural stress.

(b) The vessel must meet all applicable stability and subdivision requirements of this chapter.

§ 45.105 Information supplied to the master.

Unless otherwise authorized by the Commandant, the vessel must have onboard, ina form approved by the Commandant, sufficient information

(a) To enable the master to load and ballast the vessel in a manner that avoids unaceptable streses in the vessel's structure; and

(b) To guide the master as to the stability of the ship under varying conditions of s e .civ r
tions of service.

§ 45.107 Strength of hull.

The general structural strength of the hull must be sufficient for the draught corresponding to the freeboard assigned and must be approved by the Commandant. Ships built and maintained in conformity with the requirements of a clasification society may be recognized by the Commandant as posessing adequate strength.

§ 45.109 Strength of superstructures and deckhouses.

Each superstructure or deckhouse used for accommodations of the crew must be approved by the Commandant or the approved assigning authority with regard to general strength and weathertightness. The Commandant may use the requirements of the assigning authority as a guide.

§ 45.111 Strength of bulkheads at ends of superstructures.

Bulkheads at ends of enclosed superstructures must have sufficient strength to withstand impact of boarding seas.

§ 45.113 Access openings in bulkheads at ends of enclosed superstructures.

(a) Access openings in bulkheads at ends of enclosed superstructures must have doors of steel or material as strong as steel that are permanently attached to the bulkhead and framed, stiffened, and fitted so that the bulkhead and door are as strong as the bulkhead and weathertight when closed.

(b) The means for securing the doors weathertight must be permanently attached to the doors or bulkheads and arranged so that the doors can be secured weathertight from both sides of the bulkhead.

(c) Access openings in bulkheads at ends of enclosed superstructures must have sills that are at least 12 inches above the deck.

§ 45.115 Bulwarks and guardrails.

(a) The exposed parts of freeboard and superstructures decks and deckhouses on the freeboard deck must have guardrails or bulwarks that are at least 36 inches high above the deck.

(b) Guardrails must have at least three courses with no more than a 9-inch opening below the lowest course and no more than 15 inches between other courses. If the sheer strake projection is at least 8 inches above the deck, a guardrail may have two courses with no more than 15 inches between courses.

(c) In way of trunks at least half the protection required by paragraph (a) of this section must be in the form of open rails.

§ 45.117 Freeing Port area: General.

(a) Where bulwarks on the weather portions of freeboard or superstructure decks form wells, the bulwarks must have the area prescribed in this section and §§ 45.119 and 45.121 for rapidly freeing and draining the decks of water.

(b) Except as required in §§ 45.119 and 45.121 the minimum freeing port area in square feet on each side of the ship for each well on the freeboard deck and on the raised quarterdeck must be at least as great as A in the following formulas:

(1) Where the length of bulwark (l) in the well is 66 feet or less,

$$A = 7.6 + 0.115\ (l)$$

(2) Where (l) exceeds 66 feet,

$$A = 0.23\ (l)$$

but (l) need in no case be taken as greater than 0.7L.

(c) In ships having erections on deck that are open at either or both ends, provision for freeing the space within such erections must be approved by the Commandant or the assigning authority.

(d) The lower edges of the freeing ports must be as near the deck as practicable. Two-thirds of the freeing port area required must be provided in the half of the well nearest the lowest point of the sheer curve.

(e) All freeing port openings in the bulwarks must be protected by rails or bars spaced approximately 9 inches. If shutters are fitted to freeing ports, ample clearance must be provided to prevent jamming. Hinges must have pins or bearings of noncorrodible material. If shutters are fitted with securing appliances, these appliances must be of approved construction.

(f) The minimum freeing port area for each well on superstructure decks must be one-half of the area required by paragraph (b) of this section.

§ 45.119 Freeing port area: Changes from standard sheer.

The freeing port area required by § 45.117(b) must be multiplied by the factor in the following table 5 if the sheer differs from the standard sheer defined in § 45.63. Table 4.

TABLE 5

Freeing port area: Sheer correction.

Ratio of sums of actual sheer ord./std. sheer ord. Greater than:	*Multiplier for area required by § 45.117(b)*
1.0	1.0
1.0	1.00
0.9	1.05
0.8	1.10
0.7	1.15
0.6	1.20
0.5	1.25
0.4	1.30
0.3	1.35
0.2	1.40
0.1	1.45
No sheer	1.50

§ 45.121 Freeing port area: Changes for trunks and side coamings.

If a vessel has a trunk and does not meet the requirements of § 45.61 or has continuous or substantially continuous hatchway side coamings between detached superstructures, the minimum area of the freeing port openings must be obtained from the following table:

Breadth of hatchway or trunk in relation to the breadth of ship:	*Area of freeing ports in relation to the total area of the bulwarks (percent)*
40 percent or less	20
75 percent or more	10

The area of freeing ports at intermediate breadths must be obtained by linear interpolation.

§ 45.123 Freeing port area: Changes for bulwark height.

(a) For the purposes of freeing port area only, bulwark height is considered standard at 24 in for ships 240 ft in length and less; and 48 in for ships 480 ft in length or greater. The standard bulwark height for ships of intermediate length is obtained by direct interpolation.

(b) If the bulwark is more than standard height, the area required by § 45.117 must be increased by 0.04 square feet per foot (ft^2/ft) of length of well for each foot difference in height.

(c) For ships greater than 480 ft in length that have an average bulwark height less than 3 ft, the area required by § 45.117 may be decreased by 0.04 ft^2/ft of length for each foot difference in height.

§ 45.125 Crew passageways.

The vessel must have means for protection of the crew from boarding seas such as life lines, gangways, and underdeck passages to facilitate passing between their quarters and machinery spaces and other spaces essential to the operation of the ship.

§ 45.127 Position of structures, openings, and fittings.

For the purposes of this part—

(a) "Position 1" means in an exposed position on—

(1) The freeboard deck or a raised quarter deck;

(2) A superstructure deck or a trunk deck and forward of a point ¼ L from the forward perpendicular; or

(3) A trunk deck whose height is less than H_s.

(b) "Position 2" means—

(1) On a superstructure deck aft of a point 1/4 L abaft the forward perpendicular; or

(2) On a superstructure and trunk combination, that is H_s or more in height, aft of a point 1/4 L abaft the forward perpendicular.

§ 45.129 Hull fittings: General.

Hull fittings must be securely mounted in the hull so as to avoid increases in hull stresses and must be protected from local damage caused by movement of equipment or cargo.

§ 45.131 Ventilators.

(a) Ventilators passing through superstructures other than enclosed superstructures must have coamings of steel or equivalent material at the freeboard deck.

(b) Ventilators in position 1 must have coamings at least 30 in. above the deck and ventilators in position 2 must have coamings at least 24 in. above the deck. The Commandant or the assigning authority may also require coamings in other exposed positions.

(c) Ventilators in position 1 or 2 to spaces below freeboard decks or decks of enclosed superstructures or trunks must have coamings of steel permanently connected to the deck and any ventilator coaming that is more than 36 in. high must be specially supported.

(d) Except as provided in paragraph (e) of this section ventilator openings must have weathertight closing appliances that are permanently attached or, where approved by the Commandant or the assigning authority conveniently stowed near the ventilators to which they are to be fitted.

(e) Ventilators in position 1, the coamings of which extend to more than 12.5 ft above the deck, and in position 2, the coamings of which extend to more than 6 ft above the deck, need not have closing appliances unless specifically required by the Commandant.

§ 45.133 Air pipes.

(a) Where an air pipe to any tank extends above the freeboard or superstructure deck—

(1) The exposed part of the air pipe must be made of steel and of sufficient thickness to avoid breaking from impact of boarding seas.

(2) The air pipe must have a permanently attached means of closing its opening; and

(3) The height from the deck to any point where water may obtain access below deck must be at least 30 in above the freeboard deck, 24 in above raised quarter decks, and 12 in above other superstructure decks.

(b) If the height required in paragraph (a) of this section interferes with working the ship, the Commandant may approve a lower height after considering the closing arrangements.

§ 45.135 Hull openings at or below freeboard deck.

Closures for hull openings at or below the freeboard deck must be as strong as the structure to which they are attached and must be watertight.

§ 45.137 Cargo ports.

(a) Unless otherwise authorized by the Commandant, the lower edge of any opening for cargo, personnel, machinery access, or similar opening in the side of a ship must be above a line that is drawn parallel to the freeboard deck at side and has as its lowest point the upper edge of the uppermost loadline.

(b) The number of cargo ports in the sides of a ship must be—

(1) No more than the minimum necessary for working the ship; and

(2) Approved by the Commandant.

§ 45.139 Side scuttles.

(a) The sill of each side scuttle must be above a line that is drawn parallel to the freeboard deck at side having its lowest point 2.5 percent of the breadth or 20 in above the summer load waterline, whichever is higher.

(b) Side scuttles to spaces below the freeboard deck or to spaces within enclosed superstructures shall be fitted with hinged inside deadlights arranged so that they can be secured watertight.

§ 45.141 Manholes and flush scuttles.

Manholes and flush scuttles in position 1 or 2 or within any superstructure other than an enclosed superstructure must have permanently attached covers, unless the cover is secured by closely spaced bolts around its entire perimeter.

§ 45.143 Hull openings above freeboard deck.

Closures for openings above the freeboard deck must be as strong as the structure to which they are attached and must be weathertight.

§ 45.145 Hatchway covers.

(a) Hatchways in position 1 and 2 must have weathertight hatch covers with gaskets and clamping devices.

(b) The maximum ultimate strength of the hatchway cover material must be at least 4.25 times the maximum stress in the structure calculated with the following assumed loads:

(1) For ships 350 ft or more in length, at least 250 lb/ft^2 in position 1 and 200 lb/ft^2 in position 2.

(2) For ships less than 350 ft in length, at least AL in the following formula:

(i) Position 1:

$$AL = 200 + C$$

where $C = 50\dfrac{(L-79)}{271}$

(ii) Position 2:

$$AL = 150 + C$$

(c) Hatchway covers must be so designed as to limit the deflection to not more than 0.0028 times the span under the loads described in paragraph (b) of this section and the thickness of mild steel plating forming the tops of covers must be at least 1 percent of the spacing of stiffeners or 0.24 in, whichever is greater.

§ 45.147 Hatchway coamings.

(a) Except where the Commandant determines that the safety of the vessel will not be impaired in any sea condition, each hatchway must have a coaming that is at least—

(1) 18 inches in position 1; and

(2) 12 inches in position 2.

(b) Each hatchway coaming required by this section must be made of steel or equivalent material.

(c) The height of these coamings may be reduced or omitted if the Commandant is satisfied that safety of the ship is not thereby impaired in any sea conditions.

§ 45.149 Machinery space openings.

(a) Machinery space openings in position 1 or 2 must be framed and enclosed by steel casings, and where the casings are not protected by other structures that meet the requirements of § 45.109, their strength must be approved by the Commandant or the assigning authority.

(b) Access openings in casings required by paragraph (a) must have doors complying with the requirements of § 45.113. Other openings in such casings shall be fitted with equivalent covers, permanently attached.

(c) Except as provided in paragraph (d) of this section, coamings of any funnel or machinery space ventilator that must be kept open for the essential operations of the ship must—

(1) In position 1, extend at least 12.5 ft above the deck; and

(2) In position 2, extend at least 6 ft above the deck.

(d) The Commandant may approve a lesser height for protected coamings.

(e) Coamings of any fiddley or skylight over a machinery space opening in the freeboard or superstructure deck or the top of a deckhouse on the freeboard deck, must have covers of steel permanently attached and capable of being secured weathertight.

§ 45.151 Other openings.

Each opening other than hatchways, machinery space openings, manholes, or flush scuttles—

(a) In freeboard decks, must be protected by an enclosed superstructure or by a deckhouse or companionway that is

equal in strength and weathertightness to an enclosed superstructure; or

(b) In exposed superstructure decks or in the top of a deckhouse on freeboard decks that gives access to a space below the freeboard deck or a space within an enclosed superstructure, must be protected by a deckhouse or companionway.

§ 45.153 Through-hull piping: General.

(a) All through-hull pipes required by this subpart must be made of steel or material equivalent to the hull in strength and fatigue resistance.

(b) All valves used as shell fittings and all shell fittings on which such valves are mounted must be made of steel, or bronze or other ductile material approved by the Commandant.

§ 45.155 Inlets and discharge piping: Valves.

(a) Except as provided in paragraphs (d) and (e) of this section each pipe that discharges overboard through the hull of the ship must have—

(1) An automatic nonreturn valve with a positive means for closing; or

(2) Two automatic nonreturn valves with the inboard valve accessible for examination in service.

(b) The means for operating a valve described by paragraph (a)(1) of this section must be readily accessible and have indicators that show when the valve is not closed.

(c) If the pipe discharges from a space that is not manned or does not have continuous bilge water monitoring, a valve described in paragraph (a)(1) of this section must be operable above the freeboard deck.

(d) Each pipe that discharges from a space within an enclosed superstructure or deckhouse may have at least one accessible automatic nonreturn valve if the space is regularly visited by the crew.

(e) Through-hull piping systems in machinery spaces may have valves with positive means for closing at the shell if the controls are readily accessible and have indicators showing when the valves are not closed (nonreturn valves are not required).

§ 45.157 Scuppers and gravity drains.

Scuppers and gravity deck drains from spaces above the freeboard deck that penetrate the shell below a line 24″ or .05B above the summer loadline, whichever is greater, must have an automatic nonreturn valve. This valve may be omitted if the piping is of thickness not less than extra heavy pipe.

§ 45.159 Special conditions of assignment for type A vessels.

The lower freeboards allowed for type A vessels allow water on deck for greater percentages of time. Therefore the following additional requirements must be met to qualify for type A freeboards:

(a) Machinery casings must be protected by an enclosed superstructure or deckhouse unless intact bulkheads are used on all sides on the freeboard deck.

(b) Exposed machinery casings may be fitted with weathertight doors providing they lead to a space or passageway as strong as an enclosed superstructure from which a second interior weathertight door is provided for access to the engine room.

(c) Hatchways on the exposed freeboard or forecastle decks must be provided with watertight covers of steel.

(d) Unless a separate fore and aft access is provided below the freeboard deck, a permanent fore and aft gangway must be fitted at the superstructure deck level between poop and all other deckhouses used in the essential operation of the vessel.

(e) Type "A" vessels must be fitted with open rails for at least half the length of the exposed parts of the weather deck. Where superstructures are connected by trunks, open rails must be fitted for the whole length of the exposed parts of the freeboard deck.

(Sec. 2, 45 Stat. 1493, as amended, sec. 2, 49 Stat. 888, as amended, sec. 6(b)(1), 80 Stat. 937; 46 U.S.C. 85a, 88a, 49 U.S.C. 1655(b)(1); 49 CFR 1.46(b).)

Effective date.—These amendments shall become effective on April 14, 1973.

Dated: May 3, 1973.

T. R. SARGENT,
Vice Admiral, U.S. Coast Guard,
Acting Commandant.

APPENDIX A LOAD LINE CERTIFICATE FORM

GREAT LAKES LOAD LINE CERTIFICATE

No. ------

Issued under the authority of the Commandant, U.S. Coast Guard, United States of America, under the provisions of the Act of August 27, 1935, as amended to establish load lines on the Great Lakes of North America and the Load Line regulations in force on ---------, 19--. By ----------, duly authorized by the Commandant to issue said load line certificate.

Ship---------- Length (LBP)----------
Certificate No----- Gross tonnage----------
Official No---------- Port of registry--------
Type of Ship: TYPE "A"
TYPE "B"
TYPE "B" with increased freeboard

FREEBOARD FROM DECK LINE

Midsummer ----------	MS
Summer ----------	S
Intermediate ----------	I
Winter ----------	W

LOAD LINE

---------- above S
Upper edge of line through center of diamond.
---------- below S
---------- below S

Increase for salt water for all freeboards ---- inches.

The upper edge of the deck line from which these freeboards are measured is ---- inches above or below the top of the -------- deck at side.

This is to certify that this ship has been surveyed and the freeboards and load lines shown above have been found to be correctly marked upon the vessel in manner and location as provided by the load line regulations of the Commandant, U.S. Coast Guard, applicable to the Great Lakes.

This certificate[1] remains in force until ----------. Issued at ---------- on the ---- day of ---------- 19--. (Here follows the signature, seal, if any, and the name of the authority issuing the certificate.)

NOTES

(1) In accordance with the Great Lakes Load Line Regulations the diamond and lines must be permanently marked. The "MS" loadline shall be assigned only to those particular vessels that qualify under the regulations.

(2) The "SW" marks need only be assigned to Great Lakes vessels loading in salt water of the St. Lawrence River west of a straight line from Cap de Rosiers to West Point Anticosti Island, and west of a line along longitude 63 degrees west from Anticosti Island to the north shore of the St. Lawrence River. In such cases these limits shall be indicated on the certificate.

(3) The load line assignment given by this certificate necessarily assumes that the nature and stowage of cargo, ballast, etc., are such as to secure sufficient stability for the vessel. Accordingly, it is the owner's responsibility to furnish the Master of the vessel with stability information and instructions when this is necessary to maintenance of sufficient stability.

(On the reverse side of the load line certificate, or on a separate sheet attached and forming part of the certificate, provision is to be made for annual inspection and renewal endorsements.)

[FR Doc.73-9034 Filed 5-9-73;8:45 am]

[1] Upon the expiration of the certificate, renewal must be obtained as provided by the Great Lakes Load Line Regulations and the certificate so endorsed.